ESO 984

OHIO FARM MACHINERY
ECONOMIC COST ESTIMATES FOR 1983*

Revised and Adopted for Ohio

by

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The following information is designed as an aid in estimating farm machinery use costs for 1983. The costs are determined by formula and represent an average cost for a specific piece of machinery. These machinery costs are intended to be average estimates for the agricultural industry.

There are two types of costs associated with owning and operating a machine: Fixed costs, which are incurred whether or not the machine is used, include depreciation, interest, insurance, housing and taxes. Operating costs, which occur only when the machine is used, include fuel, lubrication, repairs and labor.

Fixed Costs

Each machine is depreciated for ten years with a salvage value of ten percent and investment credit taken at the full ten percent rate. It is assumed that a piece of equipment purchased new will be used commercially for ten years even though it may be owned by several people.

Interest and insurance are calculated by multiplying the average investment (new cost plus salvage value divided by two) times the rates of interest and insurance. Interest and insurance rates are assumed to be 14 percent and .75 percent, respectively. Housing cost is assumed to be 33 cents per square foot of shelter needed per year. There are no property taxes on farm machinery in Ohio.

Formulas Used to Compute Fixed Machinery Costs

$$\text{Depreciation per year} = \frac{\text{purchase price - investment credit - salvage value}}{\text{(years you will use machine)}}$$

$$\text{Interest per year} = \frac{\text{purchase price + salvage value}}{2} \times \text{interest rate}$$

$$\text{Insurance per year} = \frac{\text{purchase price + salvage value}}{2} \times \text{rate}$$

Housing per year = price per square foot x square foot shelter space required

Taxes per year = 0 (no taxes on personal property in Ohio)

Operating Costs

Fuel cost is calculated by multiplying the fuel consumption by the price of fuel, with fuel consumption assumed to be .06 gallons of diesel fuel per horsepower hour. The price of fuel is assumed to be $1.12 per gallon for diesel. All power units, tractors, combines, trucks, etc., are assumed to be diesel powered. An estimate of gasoline consumption can be made by multiplying the diesel fuel consumption by a factor of 1.36. Lubrication cost is assumed to be ten percent of fuel cost.

The formulas for estimating the repair and maintenance costs necessary to maintain a machine in an operable condition are provided in the 1976 Agricultural Engineer's Yearbook. They are used to estimate total accumulated repair costs according to the accumulated hours of use; the total costs are then broken down to a per hour cost estimate. The amount of annual use of a machine is an estimate of the number of hours a commercial farmer would use that particular machine in one year.

Labor is assumed to be an hourly wage rate, which includes 30 percent benefits, of $5.90 per hour for unskilled labor and $8.40 per hour for skilled labor. Labor per acre for an operation such as plowing and disking

is calculated by using the work rate on the implement instead of the tractor. Therefore, plows and disks using the same tractor have different per acre labor requirements. Less labor per acre is used in a disking operation that covers more acres per hour than in a plowing operation.

This year minimum tillage planters have been included, reflecting the current interest in minimum or reduced tillage practices in Ohio.

Machinery prices generally increased for 1983, as compared to 1982, although some prices did decline. The average price increase was 8 percent as compared to 12 percent last year. The following table compares the machinery function costs per acre for four selected items from 1979 to 1983.

Machine Function	1979	1980	1981	1982	1983
plow 6-16	$ 7.72	$10.89	$11.70	$13.28	$14.24
corn planter 6-30	6.52	8.20	9.50	10.91	10.89
combine small grain	10.78	14.54	14.61	17.85	18.57
combine corn	17.46	22.73	24.69	28.98	29.47

These cost estimates are not intended to be indicative of everyone's cost, but are intended to be used as a guide in planning the crop operation. Invidviduals have unique costs because of differences in buying power, repair programs, average annual use and overall replacement programs.

The following tables provide the 1983 machinery function costs broken down into several categories. Some relevant supporting data also is included.

TILLAGE EQUIPMENT

MACHINE	TRACTOR HP	NEW COST	ESTIMATED ACRES/HR	ANNUAL ACRES USE	TOTAL COST/ ACRE	TOTAL COST/ HOUR	CASH COST/ ACRE	PER ACRE COST			DIESEL FUEL GAL/ACRE
								TRACTOR	IMPLEMENT	LABOR	
MB PLOW 2-16	40	1526.00	1.16	139.29	15.05	17.47	3.87	7.52	2.34	5.18	2.07
MB PLOW 3-16	60	2386.00	1.75	209.45	12.92	22.55	3.81	7.03	2.44	3.45	2.06
MB PLOW 4-16	75	7881.00	2.33	279.10	15.35	35.71	4.42	6.82	5.94	2.59	1.93
MB PLOW 5-16	100	9159.00	2.91	348.74	15.34	44.59	4.72	7.73	5.54	2.07	2.06
MB PLOW 6-16	120	10980.00	3.49	453.82	14.24	49.72	4.67	7.29	5.23	1.72	2.06
MB PLOW 7-16	140	12667.00	4.07	529.27	13.55	55.17	4.58	6.90	5.17	1.48	2.06
MB PLOW 8-16	160	15770.00	4.65	604.71	13.59	63.19	4.73	6.67	5.62	1.29	2.06
MB PLOW 9-18	225	16850.00	5.89	883.64	13.31	78.40	4.73	7.98	4.31	1.02	2.29
MB PLOW 10-18	225	21743.00	6.55	981.82	13.09	85.69	4.57	7.18	4.99	.92	2.06
MB PLOW 12-18	275	23860.00	7.85	1178.18	12.39	97.31	4.47	7.05	4.57	.77	2.10
CHISEL PLOW 10 FT	75	3179.00	4.36	436.36	6.61	28.83	1.93	3.64	1.59	1.38	1.03
CHISEL PLOW 15 FT	120	4116.00	6.55	654.55	6.16	40.33	2.06	3.89	1.36	.92	1.10
CHISEL PLOW 17 FT	140	5257.00	7.42	741.82	6.11	45.35	2.10	3.79	1.51	.81	1.13
CHISEL PLOW 20 FT	160	7340.00	8.73	872.73	6.02	52.54	2.12	3.56	1.77	.69	1.10
CHISEL PLOW WING 24	225	10762.00	10.47	1047.27	7.15	74.91	2.37	4.49	2.09	.57	1.29
CHISEL PLOW WING 29	250	12810.00	12.65	1265.45	6.53	82.63	2.19	4.00	2.05	.48	1.19
CHISEL PLOW WING 35	300	15339.00	15.27	1527.27	6.41	97.91	2.18	3.99	2.03	.39	1.18
FIELD CULTIVATOR 12	75	2721.00	6.06	727.27	4.47	27.07	1.37	2.62	.85	.99	.74
FIELD CULTIVATOR 18	100	4658.00	8.73	1047.27	4.25	37.08	1.37	2.57	.98	.69	.69
FIELD CULTIVATOR 28	160	8982.00	13.58	1629.09	3.91	53.12	1.42	2.29	1.18	.44	.71
FIELD CULTIVATOR 37	225	11368.00	17.94	2152.73	3.75	67.31	1.41	2.62	1.13	.01	.75
FIELD CULTIVATOR 50	250	18213.00	24.24	2909.09	3.66	88.67	1.24	2.09	1.32	.25	.62
DISK 10 FT	60	4853.00	4.85	484.85	5.83	28.25	1.55	2.53	2.06	1.24	.74
DISK 16 FT	75	8241.00	7.76	775.76	5.00	38.78	1.32	2.05	2.18	.78	.58
DISK 17 FT	75	10877.00	8.24	824.24	5.32	43.87	1.36	1.93	2.67	.73	.55
DISK 20 FT	100	12074.00	9.70	969.70	5.48	53.10	1.51	2.32	2.54	.62	.62
DISK 21 FT	100	13154.00	10.18	1018.18	5.41	55.13	1.47	2.21	2.62	.59	.59
DISK 24 FT	120	14901.00	11.64	1163.64	5.29	61.55	1.49	2.19	2.59	.52	.62
DISK 28 FT	140	17295.00	13.58	1357.58	5.08	68.98	1.47	2.07	2.57	.44	.62
DISK 32 FT	160	19578.00	15.52	1551.52	4.93	76.42	1.48	2.00	2.54	.39	.62
DISK 40 FT	180	27131.00	19.39	1939.39	4.89	94.82	1.42	1.78	2.80	.31	.56
DISK OFFSET 14 FT	140	9915.00	6.11	610.91	8.91	54.40	2.83	4.60	3.32	.99	1.38
DISK OFFSET 16 FT	160	11011.00	6.98	698.18	8.54	59.60	2.84	4.45	3.23	.86	1.38
DISK OFFSET 18 FT	180	11838.00	7.85	785.45	8.24	64.74	2.80	4.39	3.09	.77	1.38
DISK-WING OFFSET 21	225	16705.00	9.16	916.36	9.47	86.75	2.95	5.13	3.68	.66	1.47
DISK-WING OFFSET 23	225	18255.00	10.04	1003.64	8.95	89.81	2.75	4.68	3.67	.60	1.35
LANDPLANE 45-12 FT	180	7144.00	6.40	480.00	9.31	59.61	2.93	5.38	2.94	1.00	1.69
LANDPLANE 55-14 FT	225	14657.00	8.00	600.00	11.33	90.62	2.89	5.88	4.66	.80	1.69
LANDPLANE 70-14 FT	225	15625.00	7.47	560.00	12.53	93.59	3.12	6.30	5.39	.85	1.81
SPRINGTOOTH DRAG 30	60	3237.00	16.00	480.00	2.34	37.40	.41	.77	1.17	.40	.22
SPRINGTOOTH DRAG 48	75	4352.00	30.25	1058.91	1.49	45.13	.28	.52	.76	.21	.15

TRACTORS AND COMBINES (WITHOUT HEADS)

TRACTOR HP	NEW COST	ANNUAL HOURS USE	FIXED COST/HR	VARIABLE COST/ HOUR	TOTAL COST/ HOUR	REPAIR + MAINT. COST/HR	FUEL CONS./ HOUR
40 HP	14776.00	500.00	4.82	3.91	8.73	.95	2.400
60 HP	20071.00	500.00	6.54	5.73	12.27	1.30	3.600
75 HP	26495.00	500.00	8.61	7.25	15.87	1.71	4.500
100 HP	41594.00	550.00	12.26	10.21	22.47	2.82	6.000
120 HP	45717.00	550.00	13.47	11.97	25.44	3.10	7.200
140 HP	48905.00	550.00	14.45	13.66	28.11	3.31	8.400
160 HP	56301.00	600.00	15.23	15.81	31.04	3.98	9.600
180 HP	62000.00	600.00	16.76	17.69	34.45	4.38	10.800
225 HP 4WD	80328.00	500.00	26.05	20.95	47.00	4.32	13.500
250 HP 4WD	85100.00	500.00	27.59	23.06	50.65	4.58	15.000
275 HP 4WD	92800.00	500.00	30.07	25.32	55.39	4.99	16.500
300 HP 4WD	102619.00	500.00	33.23	27.70	60.93	5.52	18.000
320 HP 4WD	105900.00	500.00	34.29	29.35	63.64	5.70	19.200
350 HP 4WD	134000.00	500.00	43.35	33.08	76.43	7.21	21.000
SML COMBINE	52125.00	400.00	28.33	25.96	54.28	18.57	6.000
MED COMBINE	69850.00	400.00	37.96	33.75	71.71	24.88	7.200
LRG COMBINE	81165.00	400.00	44.14	39.63	83.77	28.91	8.700
JMB COMBINE	104159.00	400.00	56.58	51.88	108.46	37.10	12.000

PLANTING EQUIPMENT

MACHINE	TRACTOR HP	NEW COST	ESTIMATED ACRES/HR	ANNUAL ACRES USE	TOTAL COST/ ACRE	TOTAL COST/ HOUR	CASH COST/ ACRE	PER ACRE COST TRACTOR	PER ACRE COST IMPLEMENT	PER ACRE COST LABOR	DIESEL FUEL GAL/ACRE
CORN PLANTER 4-36	40	9909.00	4.58	320.73	10.65	48.79	2.31	1.91	6.59	2.15	.52
CORN PLANTER 6-36	60	14934.00	6.87	481.09	9.81	67.41	2.30	1.78	6.59	1.43	.52
CORN PLANTER 6-30	60	13254.00	5.73	400.91	10.89	62.37	2.56	2.14	7.03	1.72	.63
CORN PLANTER 8-30	75	19945.00	7.64	534.55	11.26	86.02	2.71	2.08	7.90	1.29	.59
CORN PLANTER 12-30	100	31226.00	11.45	801.82	11.06	126.66	2.73	1.96	8.24	.86	.52
POTATO FILLER	---	10000.00	5.75	321.75	5.43	31.17	.25	0	5.43	0	.02
POTATO ROW MARKER 4R	120	8000.00	4.98	214.11	13.78	68.63	2.86	5.11	6.56	2.12	1.45
POTATO ROW MARKER 6R	140	11000.00	7.47	321.17	11.20	83.63	2.25	3.76	6.02	1.41	1.12
POTATO PLANTER 4 ROW	120	15120.00	3.83	214.50	25.18	96.43	5.56	6.64	13.87	4.66	1.88
POTATO PLANTER 6 ROW	140	20000.00	5.75	321.75	20.25	116.33	4.52	4.89	12.25	3.11	1.46
BEET PLANTER 12 ROW	100	19340.00	4.67	280.00	21.01	98.02	4.81	4.81	13.93	2.26	1.29
GRAIN DRILL PW 12 FT	40	6731.00	4.78	382.25	7.74	37.00	1.82	1.83	3.94	1.97	.50
GRAIN DRILL PW 14 FT	40	7211.00	5.57	445.96	6.88	38.35	1.62	1.57	3.62	1.69	.43
GRAIN DRILL PW 16 FT	60	8000.00	6.37	509.67	6.93	44.12	1.79	1.93	3.52	1.48	.57
GRAIN DRILL PW 20 FT	75	10618.00	7.96	637.09	6.91	55.00	1.86	1.99	3.73	1.18	.57
GRAIN DRILL PW 24 FT	75	11984.00	9.56	764.51	6.16	58.87	1.65	1.66	3.51	.99	.47
GRAIN DRILL PW 28 FT	100	16113.00	11.15	891.93	6.90	76.88	1.94	2.02	4.03	.85	.54
MIN-TIL PLANTER 4-36	60	11229.00	3.56	249.45	15.78	56.25	3.73	3.44	9.57	2.77	1.01
MIN-TIL PLANTER 6-36	75	15905.00	5.35	374.18	13.83	73.90	3.36	2.97	9.01	1.84	.84
MIN-TIL PLANTER 6-30	75	15193.00	4.45	311.82	16.10	71.74	3.93	3.56	10.33	2.21	1.01
MIN-TIL PLANTER 8-30	100	21693.00	5.94	415.76	16.47	97.82	4.18	3.78	11.03	1.66	1.01
MIN-TIL PLANTER 8-36	100	22766.00	7.13	498.91	14.17	101.02	3.58	3.15	9.64	1.38	.84
MIN-TIL PLANTER 12-3	160	33051.00	8.91	623.64	15.76	140.38	4.27	3.48	11.17	1.11	1.08

MAINTENANCE EQUIPMENT

MACHINE	TRACTOR HP	NEW COST	ESTIMATED ACRES/HR	ANNUAL ACRES USE	TOTAL COST/ ACRE	TOTAL COST/ HOUR	CASH COST/ ACRE	PER ACRE COST TRACTOR	PER ACRE COST IMPLEMENT	PER ACRE COST LABOR	DIESEL FUEL GAL/ACRE
CULTIVATOR 4-36	40	2227.00	4.65	465.45	4.20	19.55	1.01	1.88	1.01	1.32	.52
CULTIVATOR 6-36	60	3846.00	6.98	698.18	3.78	26.41	1.02	1.76	1.15	.88	.52
CULTIVATOR 6-30	60	2940.00	5.82	581.82	4.22	24.54	1.17	2.11	1.05	1.05	.62
CULTIVATOR 8-30	75	4490.00	7.76	775.76	4.04	31.34	1.15	2.05	1.20	.79	.58
CULTIVATOR 12-30	140	8870.00	11.64	1163.64	4.49	52.23	1.45	2.42	1.55	.53	.72
RIDGE-CULT 4-36	75	5200.00	4.65	465.45	7.01	32.62	1.97	3.41	2.27	1.33	.97
RIDGE-CULT 6-36	100	7200.00	6.98	698.18	6.20	43.30	1.84	3.22	2.10	.89	.86
RIDGE-CULT 6-30	100	7060.00	5.82	581.82	7.37	42.88	2.20	3.86	2.45	1.05	1.03
RIDGE-CULT 8-36	100	9440.00	9.31	930.91	5.13	47.77	1.47	2.41	2.05	.67	.64
RIDGE-CULT 8-30	100	9200.00	7.76	775.76	6.08	47.17	1.75	2.90	2.39	.79	.77
RIDGE-CULT 12-30	160	15000.00	12.36	1236.36	5.52	68.24	1.72	2.51	2.44	.57	.78
ROTARY HOE 16	40	2800.00	10.86	434.42	2.56	27.76	.43	.80	1.21	.54	.22
POTATO CULT. 4 ROW	75	3752.00	6.13	888.63	4.53	27.76	1.43	2.59	.94	1.00	.73
POTATO CULT. 6 ROW	75	4500.00	9.19	1286.98	3.18	29.20	.99	1.73	.78	.67	.49
BEET CULT. 12 ROW	100	6000.00	6.00	360.00	7.90	47.42	2.01	3.74	3.14	1.02	1.00
BEET THINNER 6 ROW	100	10000.00	2.10	210.00	24.55	51.56	6.59	10.70	9.64	4.21	2.86
BEET THINNER 12 ROW	120	20000.00	4.20	420.00	17.69	74.28	4.58	6.06	9.52	2.10	1.71
SPRAYER 30 FT	40	3390.00	14.18	1134.55	2.06	29.21	.45	.62	.69	.75	.17
SPRAYER 50 FT	60	4190.00	23.64	2363.64	1.42	33.56	.38	.52	.45	.45	.15
SPRAYER HI PRES 50FT	60	15000.00	23.64	2363.64	2.51	59.38	.74	.52	1.54	.45	.15
ANHYDROUS APPLICATOR	120	10000.00	12.73	509.09	6.38	81.23	1.45	2.00	3.77	.62	.57
FERTILIZER SPRDR 40	60	5440.00	38.79	1163.64	1.33	51.59	.18	.32	.81	.20	.09
SHREDDER 12 FT	60	5960.00	4.36	436.36	6.75	29.44	1.63	2.81	2.58	1.35	.83

HARVESTING EQUIPMENT

MACHINE	TRACTOR HP	NEW COST	ESTIMATED ACRES/HR	ANNUAL ACRES USE	TOTAL COST/ ACRE	TOTAL COST/ HOUR	CASH COST/ ACRE	PER ACRE COST			DIESEL FUEL GAL/ACRE
								TRACTOR	IMPLEMENT	LABOR	
MOWER-COND 9 FT	60	6075.00	4.09	327.27	8.35	34.17	2.08	3.00	3.77	1.59	.88
SWATHER-COND. 12 FT	---	12560.00	5.45	436.36	7.14	38.93	1.26	0	6.06	1.08	.55
SWATHER-COND. 15 FT	---	12970.00	6.82	545.45	5.88	40.09	1.03	0	5.01	.87	.44
SWATHER 12 FT	---	21687.00	5.82	465.45	10.25	59.64	1.58	0	9.24	1.01	.52
SWATHER 15 FT	---	25840.00	7.27	581.82	9.53	69.29	1.41	0	8.72	.81	.41
SWATHER 18 FT	---	27230.00	8.73	698.18	8.32	72.64	1.22	0	7.65	.68	.34
SWATHER 20 FT	---	26680.00	9.70	775.76	7.38	71.54	1.08	0	6.77	.61	.31
1 TON STACKER	60	8290.00	4.15	829.09	7.71	31.96	2.18	2.96	2.47	2.28	.87
3 TON STACKER	75	18000.00	4.84	1064.00	9.57	46.29	3.05	3.28	4.34	1.95	.93
6 TON STACKER	100	27500.00	5.53	1547.64	10.98	60.69	4.13	4.07	5.21	1.71	1.09
BALER PTO TWINE	40	9420.00	3.78	756.36	7.62	28.82	1.76	2.31	2.82	2.49	.63
ROUND BALER 1500 LB	60	12874.00	4.64	927.27	7.15	33.15	2.05	2.65	3.09	1.41	.78
ROUND BALER 1000 LB	60	9900.00	3.01	602.73	9.91	29.86	2.86	4.07	3.66	2.17	1.19
ROTARY MOWER	40	1800.00	2.73	272.73	6.82	18.60	1.76	3.20	1.45	2.16	.88
RAKE (HYD)	40	3160.00	3.49	698.18	5.31	18.53	1.45	2.50	1.12	1.69	.69
FORAGE HARV. 1 ROW	60	11990.00	.95	94.55	47.60	45.01	9.91	12.98	24.65	9.98	3.81
FORAGE HARV. 2 ROW	100	15050.00	1.65	165.45	36.98	61.19	8.93	13.58	17.70	5.70	3.63
FOR HARV 2 ROW SP	---	76100.00	2.04	305.45	59.59	121.34	14.56	0	54.96	4.63	3.63
FOR HAR 3 ROW SP	---	84410.00	3.05	458.18	43.88	134.02	10.89	0	40.79	3.09	2.78
FORAGE BLOWER LG	60	2916.00	1.00	50.00	28.43	28.43	6.40	12.27	10.27	5.90	3.60
CORN PICKER 2-38	40	15000.00	1.49	223.36	26.83	39.94	6.22	5.86	14.62	6.34	1.61
PICKER-SHELLER 2-ROW	60	16000.00	1.49	223.36	30.16	44.91	7.69	8.24	15.59	6.34	2.42
CO INE SM GRAIN SML	SML	5410.00	4.10	819.39	17.04	69.81	6.74	13.25	1.49	2.30	1.46
CO INE SM GRAIN MED	MED	5900.00	4.73	945.45	18.57	87.81	7.52	15.17	1.41	2.00	1.52
CO INE SM GRAIN LGE	LRG	8560.00	6.30	1260.61	16.32	102.84	6.70	13.29	1.53	1.50	1.38
CO INE SOYBEANS SML	SML	7560.00	3.58	716.97	20.15	72.23	7.88	15.14	2.37	2.63	1.67
CO INE SOYBEANS MED	MED	8430.00	4.14	827.27	21.91	90.61	8.78	17.34	2.29	2.28	1.74
COMBINE SOYBEANS LGE	LRG	10503.00	4.96	992.73	21.16	105.03	8.62	16.88	2.38	1.90	1.75
COMBINE CORN 3-30 SM	SML	9120.00	1.77	354.55	42.74	75.76	17.22	30.62	6.80	5.32	3.38
COMBINE CORN 2-38 SM	SML	5810.00	1.49	297.82	47.96	71.42	19.39	36.45	5.17	6.34	4.03
COMBINE CORN 3-38 SM	SML	9408.00	2.25	449.09	33.91	76.14	13.66	24.17	5.53	4.20	2.67
COMBINE CORN 4-36 MD	MED	12675.00	2.84	567.27	34.51	97.88	14.14	25.28	5.90	3.33	2.54
COMBINE CORN 4-30 MD	MED	12160.00	2.60	520.00	37.37	97.17	15.33	27.58	6.16	3.63	2.77
COMBINE CORN 6-30 LG	LRG	16460.00	3.90	780.00	29.47	114.92	12.28	21.48	5.57	2.42	2.23
COMBINE CORN 8-30 LG	LRG	22000.00	4.73	945.45	25.86	122.23	10.72	17.72	6.14	2.00	1.84
COMBINE CORN 12-30 J	JMB	34200.00	7.09	1418.18	21.77	154.37	9.74	15.30	6.34	.13	1.69
POTATO HVSTR SEED 2R	120	28000.00	1.62	323.66	48.84	79.03	12.47	15.72	19.19	13.92	4.45
POTATO HRVSTR. 2 ROW	120	35000.00	2.49	323.66	40.34	100.44	8.27	10.22	21.08	9.05	2.89
BEET LIFTER 4 ROW	100	27500.00	3.47	277.21	26.92	93.27	4.56	6.48	17.71	2.72	1.73
BEET LIFTER 6 ROW	120	38185.00	5.20	416.00	23.10	120.12	3.79	4.89	16.39	1.81	1.38
BEET TOPPER 4 ROW	75	13460.00	4.26	341.18	13.04	55.61	2.58	3.72	7.33	1.99	1.06
BEET TOPPER 6 ROW	100	18870.00	6.40	512.00	11.69	74.79	2.41	3.51	6.85	1.33	.94
BEET WAGON 8 TON	75	7080.00	3.47	277.21	10.80	37.43	2.29	4.58	4.52	1.70	1.30

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